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ABSTRACT

A professor instituted an instructional design project with a graduate class during the fall quarter of 1985 to help teachers become more aware of the potential of computers in the curriculum areas. In order to effectively use the computer with school-age children, teachers need success with the three basic components of knowledge, process, and attitude, and aspects of all three are included in the design. The design allows for a limit of 25 teachers to participate in 3-hour sessions in a microcomputer laboratory during an 11-week quarter, and individualized materials allow them to progress from simple to complex ideas. In addition, each participant develops a diary in which to summarize and react to significant learning events. Pre-assessment of the 23 study participants indicated that they generally had no comfort level using computers and only a very moderate knowledge level of computer usage. Post-assessment results indicated that all participants gained some degree of comfort and that knowledge levels rose in two out of three categories. Participants noted in their diaries a willingness to use the computer in their own classrooms. (Author/KM)

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Computer Literacy for Teachers:
An Instructional Design Consisting of the Knowledge, Process, and Attitudinal Domains

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Introduction

A professor developed an instructional design project with a graduate class during the fall quarter of 1985. He chose this project to help teachers become more aware of the potential of computers in the curriculum areas. The class members progressed in both their comfort and knowledge levels of computers. The actual design includes aspects of knowledge, process, and affective educational approaches. The design is based on pre-assessment results and proceeds through several components to evaluation.

Needs Assessment

This instructional design has component parts in which instruction can be adapted to the needs of the participants. The participants were pre-assessed in terms of their comfort levels with hands-on computer learning approaches.

The pre-assessment results were the following:

Table I

Pre-Assessed Listings Of Comfort Levels
As Given By Participants
Fall 1985

N = 23

Level of Comfort	Pre-Assessment Number	%
No Comfort	14	61%
Some Comfort	7	31%
Comfort	2	8%

Fourteen of twenty-three participants rated their comfort levels as no comfort in using the microcomputer. Seven people indicated some comfort. Two participants denoted a comfort level.

Interpretation

This class at this time does not have a comfort level in using computers.

The participants had the opportunity to pre-assess their knowledge level of computers. The results were:

Table 2

Pre-Assessed Knowledge Levels
Of Computers As Given By Participants
Fall 1985

N = 23

Knowledge Level	Pre-Assessed Number	%
Not Knowledgeable	12	52%
Some Knowledge	8	35%
Knowledgeable	3	13%

Twelve people rated themselves as not knowledgeable. Eight participants found themselves with some knowledge. Three adults indicated themselves to be knowledgeable.

Interpretation

The knowledge level of computer usage may be considered to be very moderate at this time.

Rationale

Computers are becoming more important in the daily routines of people. Young students are becoming more involved with technological advances. Computer software programs are increasingly being marketed for classroom use.

These computer trends may be restricted due to teacher unwillingness to have a computer in the classroom. The teacher may feel threatened when students may be considered as computer literate. The teacher may be fearful if students ask

for "unknown" answers to their questions. The teacher may exhibit phobic behaviors if the computer gets into an endless loop.

The teachers can effectively utilize the computer with any school age children. The success factors depend upon the teachers' awareness of commitment to and enthusiasm for the computer. If teachers experience success with the computer, then they will seek additional opportunities to extend their computer competencies. These teacher competencies will afford students more opportunties for computer use in their classrooms.

Educators may use productive learning approaches with the computer. Teachers need success with the three basic design components of knowledge, process, and attitude. The design elements are described in this paper to help teachers initially develop a systematic use of the computer.

Knowledge Objectives

1. Participants will demonstrate a working knowledge of the computer by engaging in hands-on experiences.
2. Participants will be able to locate the features and characters on the computer keyboard.

Knowledge Activities

1. Teachers will be able to program a given list of words to demonstrate their keyboard competencies.
2. Teachers will be able to identify component parts of the computer.
3. Teachers will be able to follow instructions in running a given piece of software.
4. Teachers will be able to supervise a given computer activity with another teacher and/or student.

Process Objectives

1. Participants will actively participate in computer activities regardless of outcome.

2. Participants will experiment with given computer activities.

Process Activities

1. Teachers will practice the running of a given and clearly stated program.
2. Teachers will experiment with simple commands inherent in the basic language.
3. Teachers will choose a software disk to use in keeping with their present abilities.
4. Teachers will be able to select their software by experimenting with simple and complex software packages available to them.

Affective Objectives

1. Participants will be encouraged to use the computer outside the regular class time.
2. Participants will demonstrate a favorable attitude towards their use of the computer.

Affective Activities

1. Teachers will willingly help other teachers who need assistance.
2. Teachers will choose to do computer activities during their free time.
3. Teachers choose partners to accomplish problem-solving computer tasks.
4. Teachers will react favorably to professor guidance in assuming lower level computer tasks or more challenging computer tasks.

Criteria for Instructional Materials

1. Simple computer books heighten teacher interest in computer literacy.
2. Individualized materials allow teachers to progress from simple to complex ideas.
3. This design encompasses a wide range of materials for practice and motivational purposes.
4. Teachers are encouraged to develop ideas for their own classrooms when needed and desired.

Organizational Pattern

This instructional design allows for a limit of twenty-five teachers to participate in a microcomputer lab. One professor can manage this design effectively with some use of peer teaching. The materials allow for individual progress of the participants.

Staffing and Time

The lab sessions and instructional times occur within a laboratory situation. One professor who has competency in individualized strategies can faciltate computer literacy in three-hour sessions during an eleven-week quarter.

Record Keeping

Each participant develops a diary in which he summarizes and reacts to significant learning events. The participant writes one paragraph of summary and one paragraph of reactions to the summary.

Post-Assessment Evaluation

Comfort Levels

The post-assessment for the comfort level was done. The following table includes the eleventh week result and the change from the pre-assessment finding. The results were the following:

Table 3

Post-Assessment Listings of Comfort Levels as Given by Participants at Eleventh Week and the Percentage Change from the Pre-Assessment Result

N=23

Level of Comfort	Final Assessment	%	Percentage Change from Pre-Assessment
No comfort	0	0%	+100%
Some comfort	17	74%	+59%
Comfort	6	26%	+67%

The no comfort level rose 100% from the first class to the eleventh week. The some comfort category rose 59%. The comfort area increased 67%.

Interpretation

Participants gained comfort in using a computer. All people gained some degree of comfort. This comfort gain provides teachers with a base to expand their knowledge levels of computer use.

Knowledge

The post-assessment for the knowledge level was accomplished. The following table includes the eleventh week result and the percentage change with the pre-assessment measure. The results were the following:

Table 4

Listings of Knowledge Levels as Given by Participants at Eleventh Week and the Percentage Change from the Pre-Assessment Results

N=23

Level of Knowledge	Final Assessment	%	% Change from Pre-Assessment
Not knowledgeable	5	22%	+42%
Some knowledge	16	70%	+50%
Knowledgeable	2	8%	-33%

The not knowledgeable category had a positive change of 42% from pre-assessment to post-assessment. The some knowledge level increased by a positive margin of 50%. The knowledgeable deceased by a negative amount of 33%.

Interpretation

The knowledge levels rose in all categories with the exception of the knowledgeable level. This negative factor was a change of one student which made the negative percentage seem higher than it actually was.

Conclusions Based on the Reading of the Diaries

The professor studied and analyzed the logs of summaries and reactions of teachers at the eleventh week. He found the common patterns to be the following:

1. Teachers tended to be fearful for the first two sessions.
2. Teachers have underlying feelings of being potentially embarrassed in class.
3. Teachers began to realize that they gained more computer knowledge than originally expected.
4. Group influence tends to reduce anxiety levels of the teachers.
5. Frustration was a common factor in all the diaries.
6. Teachers tend to react more positively when application can be realized for their teaching positions.
7. Most teachers tended to work well with a partner, while approximately 20% felt the need for one computer per participant.
8. Teachers tended to be curious about the upcoming computer session.
9. Teachers noted a willingness to eventually use a computer in their classrooms.